Mouse muscles mimic newt regeneration

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A disclaimer: this work was not funded by CIRM, nor does it directly have to do with stem cell research. It is, however, extremely cool, and strikes close to home. I spent hours as an undergrad slicing off the limbs of newts and marveling as the tiny fingers and toes re-emerged on newly formed limbs. Now Helen Blau at Stanford University has for the first time replicated that magic in mammals.

In a Stanford press release, Blau is quoted as saying:

> "Newts regenerate tissues very effectively. In contrast, mammals are pathetic. We can regenerate our livers, and that's about it. Until now it's been a mystery as to how they do it."

Admittedly, the group didn't regrow entire mouse limbs. What they did is prod mouse muscles to divide - something that mammalian muscles don't generally do, and that needs to happen in order to form working limbs. It turns out that two genes normally required to prevent cancer also prevent muscle cells from dividing. Temporarily blocking those genes returned the muscles to a dividing state. As the press release makes clear, the key is "temporarily":

> As is clear from the mouse experiments, blocking the expression of tumor suppressors in mammalian cells can be a tricky gambit. Permanently removing these proteins can lead to uncontrolled cell division. But, a temporary and well-controlled loss - as the researchers devised here - could be a useful therapeutic tool.

Nicholas Wade wrote about the work in the New York Times:

> Jeremy Brockes, a leading expert on regeneration at University College London, said the report was "an excellent paper." Though there is a lot still to learn about the process, "it is hard to imagine that it will not be informative for regenerative medicine in the future," he said.

Although CIRM didn't fund this work, Blau does have a Tools & Technologies award and a Basic Biology I award. She's featured in this recent blog entry about her CIRM-funded work.

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Tags: Blau, Stanford University, Regeneration